

ABSTRACT OF THE DISCLOSURE

A paste including metal or metal alloy particles (which are preferably silver or silver alloy), a dispersant material, and a binder is used to form an electrical, mechanical or thermal interconnect between a device and a substrate. By using nanoscale particles (*i.e.*, those which are less than 500 nm in size and most preferably less than 100 nm in size), the metal or metal alloy particles can be sintered at a low temperature to form a metal or metal alloy layer which is desired to allow good electrical, thermal and mechanical bonding, yet the metal or metal alloy layer can enable usage at a high temperature such as would be desired for SiC, GaN, or diamond (*e.g.*, wide bandgap devices). Furthermore, significant application of pressure to form the densified layers is not required, as would be the case with micrometer sized particles. In addition, the binder can be varied so as to insulate the metal particles until a desired sintering temperature is reached; thereby permitting fast and complete sintering to be achieved.